

which the genitalia of five different males are figured in illustration of that point ('Revue Russe d'Entom.,' xii, p. 77; 1912). The fore wings of one of the females from Mikra show that, in addition to such a comparatively minor matter as the more or less open condition of the triangles, the cells in the discoidal area may be reduced from three rows to two rows. Mr. K. J. Morton has kindly given me the benefit of his ripe knowledge of Palæartic Dragonflies, and has confirmed my reference of this critical material to Schneider's species.

Orthetrum brunneum, Fonsc.—2 ♀, Mikra, 15-22, vii; 1 ♂, Kalamaria, 17-23, vii; 3 ♀, Karasouli, vii-viii; 1 ♀, Giol Ajak, vii-viii.

Orthetrum cancellatum, Linn.—1 ♂, 1 ♀, near Salonica, 15-22, vii; 1 ♂, Kalamaria, 17, vii; 1 ♂, 2 ♀, Giol Ajak, vii-viii.

Crocothemis erythræa, Brullé.—1 ♂, Mikra, 15-22, vii; 3 ♂, 1 ♀, Giol Ajak, vii-viii.

Sympetrum fonscolombi, Selys.—1 ♂, Kalamaria, 17, vii.

Sympetrum sanguineum, Müll.—2 ♀, Giol Ajak, vii-viii.

Selysiotemis nigra, Lind.—3 ♂, 2 ♀, Giol Ajak, vii-viii.

This remarkable-looking Dragonfly, with its white and sparse venation, is by far the most interesting species in the collection. Although it was first described as long ago as 1825, and has since been recorded, on rare occasions, from localities as far apart as Catalonia on the west, Kashgar on the east, and Algeria on the south, seemingly it still remains quite an uncommon insect in collections.

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ.

No. 3.—MICROGASTERIDÆ.

By G. T. LYLE, F.E.S.

(Concluded from p. 111.)

Hospes, Marsh.*

In Harwood's collection are two females and a male, labelled "*Microgaster hospes*, N. sp.," in Marshall's writing; these I believe to be the three specimens formerly in Cameron's collection from which Marshall compiled his description (on the back of the card on which they are mounted, is written "G.B.C., 31/8"). Marshall tells us they differ from *tibialis* in having almost hyaline wings and no carina on the metathorax, also that the terebra is more clavate. I have examined the

* 'Trans. Entom. Soc.,' 1885, p. 257.

three insects carefully and find distinct traces of a medial metathoracic carina in the male. Unfortunately, the insects are not in very good preservation and are carelessly mounted as all Cameron's insects appear to be. Harwood has also another male, labelled "*M. tibialis*," by Marshall, which is certainly the same.

Scoticus, Marsh.*

This species is distinguished by its unusually long antennæ and short abdomen, the third segment being sub-rugulose. I have seen the type, also in Harwood's collection, which is still in good preservation (the antennæ were broken at the time it was described by Marshall) and bears the original label. No other example has yet been recorded.

Genus 6.—*Hygroplitis*, Thoms.

Founded for the reception of two species, *Microgaster russatus*, Hal., and *M. rugulosus*, Nees, to which we must now add *M. abdominalis*, Nees, a species with which Thomson was not acquainted. The original description (*opus* xlvi, p. 2238) is as follows:

"Alæ areola completa, Tibiæ posticæ calcaribus longis. Sternauli sat distincti. Abdomen segmento 2:0.3:0 rugoso fere duplo longiore. Unguis et pulvillus magni."

Abdominalis, Nees.†

After *russatus*, the finest species of the family; is easily recognised by the bright orange colour of the inner half of the stigma. This is, no doubt, the insect described by Wesmael as *M. deprimator*, Panz.‡ Hitherto it has been noticed on the Continent only, but I am adding it to the British list on the strength of a fine male capture by Harwood in High Woods, Colchester, in 1906. A scarce insect, very few captures having been recorded; the female is mentioned by Reinhard only who says it resembles the male and has a very short terebra.

Russatus, Hal.§

This large and striking species has the first three abdominal segments entirely rufous and the stigma bicolorous. A scarce insect which has not yet been bred in this country; on the Continent Brischke records it from *Orthotelia sparganella*. The only specimen I have seen, with the exception of those in the National Collection mentioned by Marshall, is a fine male taken by Harwood, near Colchester, on August 2nd, 1914.

* 'Trans. Entom. Soc.,' 1885, p. 251.

† 'Mon.,' i, p. 163.

‡ 'Nouv. Mém. Ac. Brux,' 1837, p. 30.

§ 'Entom. Mag.,' ii, p. 237.

Rugulosus, Nees.*

A large stout species having the first three abdominal segments noticeably rugulose. In the female the abdomen is apically dusky rufous, while in the male it is entirely black. Also rare; Marshall knew but two or three from the collections of Fitch and Desvignes, Morley records one only, and Bignell makes no mention of the species. I have seen four males and three females taken by Dr. D. Sharp in the New Forest, in June, 1902, and now in the Cambridge University Museum.

Genus 7.—*Microplitis*, Forst.†

Distinguished by the very short hind tibial spurs, which are scarcely one-third as long as the metatarsus. Solitary or gregarious parasites of the larvæ of *lepidoptera*. Mostly robust, black insects, with more or less infumated wings and a noticeable, smooth, and shining tubercle at the apex of the first abdominal segment. I have examined the larvæ of several species and find them to differ in appearance from those of *Apanteles* and *Microgaster*, being covered with purple blotches, while the intestinal canal shows as a dark purple line; the lateral protuberances on segments 4–10 are very pronounced. Cocoons stout, smooth, often tan-coloured or greenish, and in one or two cases deeply fluted and much resembling caraway seeds.

Xanthopus, Ruthe.‡

Only one British specimen appears to be known—namely, that mentioned by Marshall ('Trans. Entom. Soc.', 1885, p. 231) as being in Bridgman's collection. This insect is now in the possession of Mr. B. S. Harwood, and bears a label "*Microplitis xanthopus*, Ruthe" in Marshall's handwriting. Unfortunately, the specimen is much dilapidated, having lost all the abdomen with the exception of the first two segments, portions of both antennæ, and the greater part of four legs; it is, however, still quite recognisable. The card bears the number 189 on the back.

Distinguished by the testaceous hind tarsi and broad, truncate first abdominal segment which is much narrowed towards the base.

Ocellata, Bouche.§

A robust, shining, black species, well known as a common, gregarious parasite of the hawk-moths, *Smerinthus ocellatus* and *S. populi*. It is, perhaps, strange that I have never reared or captured this insect in the New Forest, where the hosts are plentiful.

* 'Mon.', i, p. 163.

† 'Verh. pr. Rheinfl.', 1862, p. 245.

‡ 'Berl. ent. Zeit.', 1860, p. 147.

§ 'Naturg.', 1834, p. 161.

Vidua, Ruthe.*

Somewhat similar to *ocellatæ* and very near *tuberculifera*. From the latter it is easily separated, having the first abdominal segment shorter and broader and not gradually narrowed towards the apex. Marshall says the cocoon most resembles that of *tuberculifera*, but is larger and more irregularly wrinkled. In many cases this is so, but the extent and depth of the fluting varies even more than in *tuberculifera* (Fig. 6). I have cocoons of *vidua* obtained from *Euclidia mi*, in which the fluting is more regular and pronounced than in any cocoon of *tuberculifera* I have ever seen, while in others from the same host the wrinkling is scarcely noticeable. The similarity between the cocoons of the two species has led to some confusion, and I fear that collectors, on obtaining the deeply fluted examples, have referred them to Wesmael's species without examining the insects themselves.

This is the parasite of *Euclidia mi*, from which host I have often bred it in late April and May, the insects having passed the winter in the larva state within their cocoons. Some of these I have obtained from New Forest larvæ of the host, and others have been sent to me from Limber, N. Lincs (Cockayne), Eastbourne and Kent (Colthrop), and S. Coast and Colchester (Harwood). Always a solitary parasite.

Usually the hind femora are wholly or partially black, but in Harwood's collection are three, bred from larvæ of *Apamea basilinea* taken at Newbury, having the hind femora entirely rufo-testaceous and, in two cases, the stigma bicolorous. I cannot think these are more than a variety which is very near, if not identical with, *strenua*, Rein.

The parasite larva emerges from the dorsal surface of the host and attaches its cocoon to the caterpillar. I have recorded a similar habit of the larva of *Diolcogaster circumvectus*, though in that case the cocoon of the parasite is carried erect on the back of the host, while in *M. vidua* it is always in a horizontal position.

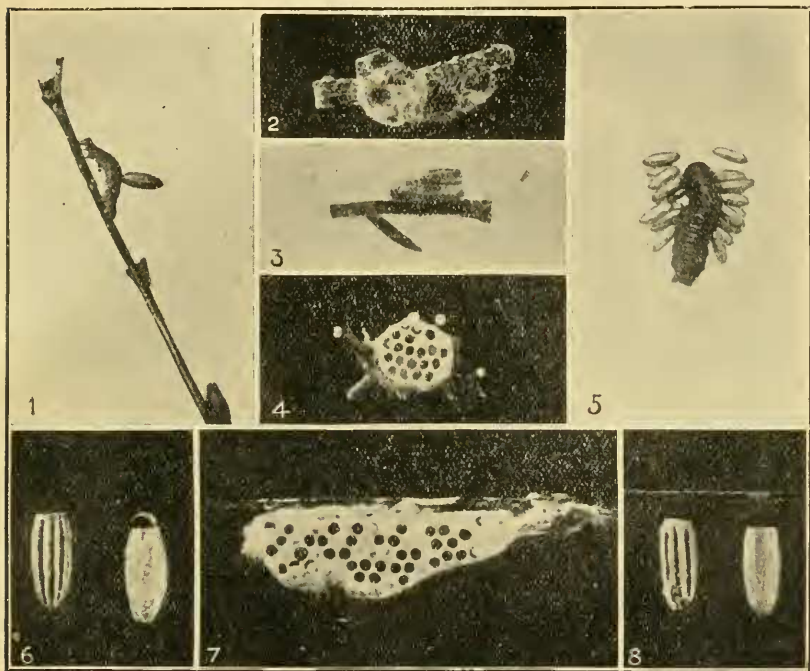
From a number of cocoons of this species sent to me by Dr. E. A. Cockayne from Limber, Lincs, I reared several specimens of the hyperparasite *Mesochorus pectoralis*.

Ruricola, sp. nov.

Black, palpi pale testaceous, mandibles dark claret colour, sides of first abdominal segment sometimes testaceous. Legs rufo-testaceous, all the coxæ, base of trochanters, hind femora narrowly at base (sometimes at apex also) and all the tarsi, except basally, nigrescent. Wings infumated with a darker stain under the stigma and also in the first discoidal cell; stigma and nervures dark fuscous, the latter testaceous near base of wing. Antennæ of male as long as body, of female barely reaching the apex of first abdominal segment. Mesothorax coarsely punctate, sutures scarcely indicated; scutellum

* 'Berl. ent. Zeit.', 1860, p. 134.

rugulose; metathorax coarsely rugulose. Abdomen shining; first segment rugulose, twice as long as its greatest breadth, slightly narrowed towards base, rounded and somewhat pointed at apex with a smooth and shining apical tubercle; second smooth, shorter than third, centrally longitudinally raised; other segments smooth. Terebra not surpassing anus; spurs of hind tibiæ barely one-third as long as metatarsus. Length, $3\frac{1}{2}$ –4 mm.; expands 8–9 mm.



1. Cocoon of *Diolcogaster circumrectus*. Natural size.
2. Cocoon of *Microplitis sordipes*. $\times 3$.
3. Cocoon of *Microplitis ruficola*. $\times 2\frac{1}{2}$.
4. Cocoon of *Microgaster minutus*. $\times 2$.
5. Cocoon of *Microplitis mediator*. Natural size.
6. Cocoon of *Microplitis vidua*. $\times 2\frac{1}{2}$.
7. Cocoon of *Microgaster alvearius*. $\times 2$.
8. Cocoon of *Microplitis tuberculifera*. $\times 2\frac{1}{2}$.

Described from three males and one female.

Cocoon dull greenish grey with a few irregular, longitudinal wrinkles, not noticeably pointed at either extremity (Fig. 3).

A somewhat squat species with stout legs which are liable to vary in colour. The first abdominal segment is not subquadrate as in *ocellate*; from *vidua* it differs in having the metathorax more coarsely rugulose and the female antennæ shorter; from *spinolæ* in the unicolorous stigma, colour of cocoons, etc.; from *xanthopus* in the shape of the first abdominal segment; and from

fumipennis, Rotz, in the smooth, second abdominal segment. It is near *varicipes*, Ruthe, which has the first segment smooth, and is very like, but not, *cremita*, Ruthe, that being a gregarious parasite and constructing totally different cocoons; differs widely from *adunca* in the colour of the legs and in having the second cubital areolet not particularly small.

I have several times swept this insect from heather in the New Forest in July (21st to 31st), also one specimen on May 10th, 1911, and have bred it, as a solitary parasite, from half-grown larvæ of *Anarta myrtilli*, August 5th and 8th, 1911.

Tristes, Nees.*

A shining black species with dark wings. Very near *dolens*, and I am almost inclined to doubt if it is really distinct from that species.

Marshall gives the scutellum as smooth, with the fore femora at apex and all the tibiæ obscurely rufous, which does not agree with my specimens, for in them the scutellum shows distinct punctuation, and the fore femora, with the exception of the extreme base, the middle femora at apex, and all the tibiæ are clear rufo-testaceous. Cocoons gregarious, pale-reddish, rather more woolly, and somewhat lighter in colour than those of *mediator*; constructed beneath the surface of the ground. A very common parasite of larvæ of the genus *Dianthæcia* appearing in broods of from twelve to twenty. I have reared broods from larvæ of *D. capsincola* taken at Deal and Paignton, and from *D. cucubali* taken at the latter place by Colthrup, and have found it preying commonly on larvæ of *D. capsincola* near Cambridge. Shortly after sunset on the evening of September 1st, 1917, I noticed, in a wind-swept field, a female of this species slowly crawling on a campion head which evidently contained a caterpillar. Boxing both seed-head and insect, I carried them in my pocket for some five miles, and on reaching home was surprised to find that the jolting received had apparently not greatly disturbed the Braconid, as it was still leisurely examining the seed-head with its antennæ, and even on the following morning I found it similarly engaged. In spite of such perseverance, however, it did not succeed in reaching the concealed larva, which duly pupated a week or ten days later.

Sordipes, Nees.†

First recorded as British by Morley ('Entom.', xxxix, p. 103), who mentions a specimen reared at Ely from *Acronycta psi* and another from the New Forest. A shining black species with the legs testaceous, only coxæ and hind tarsi fuscous; first abdominal segment slightly rugulose, second quite smooth. Very similar to

* 'Mon.', i, p. 168.

† 'Mon.', i, p. 167.

ocellatæ, though the suturiform articulation is more pronounced than in that species. Cocoons dark brown with an irregular, lighter, medial band; firmly attached, crosswise, to a twig (Fig. 2).

In the New Forest I have reared it from a half-grown larva of *A. alni* (September 16th, 1916), and have also from *A. psi*. A solitary parasite.

Spectabilis, Hal.*

The smallest species; wings not so dark as in *tristis*, and usually with a yellow spot at the inner angle of the stigma. The hind femora are generally more or less infuscate, though I have specimens in which they are pure rufo-testaceous. Cocoons similar to those of *M. tristis*.

From a larva of *Dyschorista fissipuncta* sent me by Mr. T. Grosvenor from Redhill I obtained a brood of twenty-two, and I captured two specimens in May, 1917, near Cambridge. Harwood has a female taken by Cameron at Cadder which bears Marshall's label.

Mediator, Hal.†

A small species, distinguished by its pale antennæ (the first seven or more joints of the flagellum are flavo-testaceous), and commonly reared from larvæ of *noctuæ*. Gregarious, in broods of from ten to twenty-two. The larvæ emerge in almost equal numbers from either side of their host, and construct their smooth tan-coloured cocoons in two compact masses which are not attached to the caterpillar (Fig. 5). The host always remains, as if brooding over the cocoons, until its death: as a rule, this does not take place until a fortnight or so after the parasite larvæ have emerged. I have numerous broods obtained from larvæ of *Triphæna fimbria* and *T. janthina* in April and early May, all from the New Forest. The hosts perished when about half-grown, and I think it probable that they were "stung" before hibernation.

Mediana, Ruthe.‡

Very similar to *mediator*, but differing therefrom in having the antennæ dark and the second and third segments of the abdomen almost entirely testaceous. It might very easily be taken for a pale form of *tuberculifera*, though Marshall tells us the cocoon is greenish-white.

In Harwood's collection are two specimens labelled "*mediana*, Ruthe" in Marshall's writing; on the back of one card is written "Brundall, 28/7/81"; probably they were at one time in Bridgman's collection.

Tuberculifera, Wesm.§

One of the commonest species we have; has been reared many times, as a solitary parasite, from young larvæ of *noctuæ*.

* 'Ent. Mag.,' ii, p. 236.

† 'Ent. Mag.,' ii, p. 235.

‡ 'Berl. ent. Zeit.,' 1860, p. 127.

§ 'Nouv. Mem. Ac. Brux.,' 1837, p. 43.

Bignell tells us that Parfitt obtained four from a larva of *Eupithecia succenturiata*, but this record of gregarious parasitism appears to be quite isolated. Differs from *mediana* in having the second, excepting at the base, and third abdominal segments black; from *vidua* in the shape of the first segment, which is rather more than twice as long as broad and attenuated towards the apex. The legs are reddish, and the stigma is generally bicolorous, though often the "*petite tache blanchâtre à la base*" mentioned by Wesmael is scarcely noticeable. Cocoons grey with irregular longitudinal dark fluting; this ribbing is much more pronounced in some than in others (Fig. 8).

Harwood has two specimens from Cameron's collection named by Marshall, one labelled "Kenmuir, 7/72," the other "Clober." In the New Forest I have obtained it from a larva of *Stilbia anomala*, April 28th, 1908, from *Tæniocampa miniosa* several times in June (15th to 28th), and taken it on the wing September 3rd, 1916. Bred from *Noctua xanthographa* at Burgess Hill, Sussex, June 28th, 1908, and four times from larvæ of *Mania typica* taken at Dulwich by Colthrup.

Borealis, Marsh.*

Described from a single specimen taken by Cameron at Glenelg, N.B. The type, which I have seen, is now in Harwood's possession, and bears Marshall's label. As mentioned in the original description it is very near *lugubris*, Ruthe; the first segment is narrow, smooth, shining, more than twice as long as broad, and attenuated from base to apex; segments one and two laterally testaceous.

Mæsta, Ratz.†

Among the insects obtained by Harwood from Fitch's store-boxes is one labelled by Marshall "*Microplitis mæsta*, n. sp." On the back of the card is the number 252, but no data. Judging from the setting, this is not one of Cameron's insects, and came, more probably, from Bridgman's collection. The specimen may be continental, though I do not think this likely. It agrees with the description of Ratzeburg, excepting that the first abdominal segment is not rugose; to me it appears very like a pale *tristis*.

In 'Brac. d'Europe,' etc., this species is included by Marshall in his list of doubtful or imperfectly described species, and noted as bred from a *Psyche* in Germany.

Note.—Near the commencement of my notes on the *Microgasteridæ* (vol. xlv, p. 123), I mentioned that only one species of the genus *Acælius*, Hal., had been found in Britain, namely, *A. subfasciatus*, Hal. When making this statement I had, unfortunately, overlooked Mr. Donisthorpe's most interesting note in 'Ent. Record,'

* 'Trans. Entom. Soc.,' 1885, p. 237.

† 'Die Ich der For.'

1908, p. 284, where is recorded the capture of *A. viator*, Forst., in Scotland. A single specimen only was taken, and Mr. Donisthorpe informs me that no other has since occurred to him. I am indebted to Mr. Claude Morley, who named the insect, for drawing my attention to this record.

NOTES AND OBSERVATIONS.

ARCTIC LEPIDOPTERA.—My paper on the distribution of *Plebeius argus* in Scandinavia has brought me several very interesting communications. Among them a letter from Mr. Henry Baker, of Cannington, Bridgwater, who visited the Murman coast of Russian Lapland in June, 1895. He was encamped with the Russian Lapps at Lutni, at the mouth of the river which falls into Sviatanoskaia Bay on the Arctic Ocean, west of the White Sea. He has kindly added to my collection a female example of *Erebia ligea* (? *euryale*) var. *adyte*, "the only lepidopteron observed there," captured on June 25th.—H. ROWLAND-BROWN.

GREEN PUPA OF EUCHLOË CARDAMINES.—With reference to Mr. Frohawk's note (*antea*, p. 41) as to the colour of pupæ of *E. cardamines* in state of nature: as the pupa seems to be so seldom found wild, it may be of interest to know that I found a pupa in surroundings which I remember well, during the winter either at the beginning or the end of 1901. It was on a twig in an old hawthorn hedge, on the roadside at Grange. The pupa was a very conspicuous green object, and looked like a solitary green leaf, folded along its midrib, in an otherwise brown and leafless hedge. It was at least 2 ft. 6 in. above the hedge bottom and about a foot "inside" the hedge. The hedge being on a low bank, the pupa was almost at eye-level. I had taken no interest in natural history for a year or two, and observing or collecting would be far from my mind when the pupa forced itself on my attention. Unfortunately, I made no written record. I remember my surprise that the pupa had escaped capture, or destruction, so long. A few days later I found it easily, at night, by the light of a match. Some few days later still it had gone. Garlic mustard, or one of its relations, grows abundantly in a similar hedge close by, and probably had grown where I found the pupa. It seems to confirm Mr. Frohawk's surmise, that pupation usually takes place in hedgerows, low down amongst the undergrowth. In this case, by accident of position, a protective colour became as conspicuous as a warning colour.—J. D. WARD; Limehurst, Grange-over-Sands, Lancs.

THE BLUE-HAIRED CARPENTER-BEES.—I have just received from Prof. C. F. Baker two females of the blue-haired species of *Mesotrichia* (sub-genus *Cyaneoderes*, Ashmead). The larger one, from the Island of Penang, is *M. cærulea* (Fabr.). The smaller, from Singapore, is *M. dormeyeri* (*Cyaneoderes dormeyeri*, Enderlein, 1909), which was described from Singapore and the Island of Nias. The male from Singapore, which I reported as *M. cæruleiformis* (Meade-Waldo), is *dormeyeri*. Meade-Waldo's species appears to be no